405 KAR 5:055. Permanent and temporary impoundments.

RELATES TO: KRS 350.010(2), 350.240, 350.300
STATUTORY AUTHORITY: KRS Chapter 13A, 350.028, 350.029, 350.240, 350.300
NECESSITY, FUNCTION, AND CONFORMITY: KRS Chapter 350 in pertinent part, requires the cabinet to promulgate administrative regulations pertaining to noncoal mineral operations to minimize their adverse effects on the citizens and the environment of the Commonwealth. This administrative regulation sets forth provisions for impoundments.

Section 1. Requirements for Permanent and Temporary Impoundments. (1) Design certification. The design of impoundments shall be certified by a qualified registered professional engineer as designed to meet the requirements of this administrative regulation using current, prudent engineering practices, and any design criteria established by the cabinet. The qualified registered professional engineer shall be experienced in the design and construction of impoundments.

(2) All impoundments classified as Class B-moderate hazard or Class C-high hazard, and all permanent "dams," as defined in KRS 151.100, shall comply with 401 KAR 4:030. Criteria for the hazard classifications are established by 401 KAR 4:030.

(3) Stability.

(a)1. Permanent and temporary "dams" (as defined in KRS 151.100), permanent and temporary Class B and C impoundments, and all permanent impoundments, shall have a minimum static safety factor of 1.5 for the normal pool with steady seepage saturation conditions, and a seismic safety factor of at least one and two-tenths (1.2).

2. Impoundments not included in subparagraph 1 of this paragraph shall have a minimum static safety factor of one and three-tenths (1.3) for the normal pool with steady state seepage saturation conditions.

(b) The constructed height of the dam shall be increased a minimum of five (5) percent over the design height to allow for settlement, unless it has been demonstrated to the cabinet that the material used and the design will ensure against all settlement.

(c) The minimum top width of the embankment shall not be less than the quotient of (H+35)/5, where H is the height, in feet, of the embankment as measured from the upstream toe of the embankment to the top of the embankment.

(d) Unless the cabinet approves steeper slopes, based upon a satisfactory demonstration of stability by the applicant acceptable to the cabinet, the sum of the upstream and downstream side slopes (h/v) of the settled embankment shall not be less than 5h:1v, with neither slope steeper than 2h:1v. Slopes shall be designed to be stable in all cases, even if flatter side slopes are required.

(e) The fill material shall be free of sod, large roots, other large vegetative matter, and frozen soil.

(f) The placing and spreading of fill material shall be started at the lowest point of the foundation. The fill shall be brought up in horizontal layers of such thickness as is required to facilitate compaction and meet the design requirement of this administrative regulation. Compaction shall be conducted as specified in the design approved by the cabinet.

(g) The entire embankment including the surrounding areas disturbed by construction shall be stabilized with respect to erosion by a vegetative cover or other means immediately after the embankment is completed. The active upstream face of the embankment where water will be impounded may be riprapped or otherwise stabilized and no vegetative cover is needed. Areas in which the vegetation is not successful or where rills and gullies develop shall be repaired and revegetated.

(h) Slope protection shall be provided to protect against surface erosion at the site and protect against sudden drawdown.

(i) Measures shall be taken to control seepage in order to ensure stability of the embankment.

(4) Freeboard. Impoundments shall have adequate freeboard to resist overtopping by waves and

by sudden increases in storage volume. The minimum elevation at the top of the settled embankment shall be one (1.0) foot above the water surface in the impoundment with the emergency spillway flowing at design depth. For embankments subject to settlement, this one (1.0) foot minimum elevation requirement shall apply at all times, including the period after settlement. Freeboard requirements shall not apply to incised impoundments which have no embankment or levee.

(5) Foundation.

(a)1. Foundation and abutments for the impounding structure shall be designed to be stable under all conditions of construction and operation of the impoundment and shall be designed based on adequate and accurate information on the foundation conditions.

2. For permanent and temporary "dams" (as defined in KRS 151.100), for permanent and temporary Class B and C impoundments, and for all permanent impoundments, foundation investigations as well as any necessary laboratory testing of materials shall be performed in order to determine the design requirements for foundation and embankment stability.

3. Where an approved temporary impoundment has been constructed and the mineral permittee subsequently seeks a permit revision to upgrade the structure to a permanent impoundment, the cabinet may waive the foundation investigations and laboratory testing required by subparagraph 2 of this paragraph under the following circumstances:

a. The structure has been recently verified as being a Class A-low hazard structure;

b. The structure does not meet the definition of the term "dam," as defined at KRS 151.100; and

c. The cabinet approves conservative, assumed values for the strength parameters used in the stability analyses to ensure compliance with subsection (3)(a) of this section.

(b) All vegetative and organic materials shall be removed and foundations excavated and prepared to resist failure. Cutoff trenches shall be installed if necessary to ensure stability.

(6) Spillways. Impoundments shall include a combination of principal and emergency spillways which shall be designed and constructed to safely pass the design precipitation event specified in this subsection, unless the cabinet requires a larger event. Twenty-four (24) hours may be used in lieu of six (6) hours for the duration of a design precipitation event specified in this subsection.

(a) Class A impoundments that are not "dams" (as defined in KRS 151.100) shall pass the:

1. Twenty-five (25) year, six (6) hour precipitation event if it is a temporary impoundment; or

2. The fifty (50) year, six (6) hour precipitation event if it is a permanent impoundment.

(b) Temporary Class A impoundments that are "dams" (as defined in KRS 151.100) shall pass the 100 year, six (6) hour precipitation event.

(c) Permanent and temporary Class B and C impoundments and all permanent "dams" (as defined in KRS 151.100) shall comply with the criteria established in 401 KAR 4:030.

(d) Emergency spillway grades and allowable velocities shall be approved by the cabinet.

(7) Single spillway. Class A impoundments that are not "dams" (as defined in KRS 151.100) may use a single spillway if the spillway:

(a) Is an open channel of nonerodible construction and capable of maintaining sustained flows; and

(b) Is not earth or grass lined.

(8) Temporary impoundments existing on the effective date of this administrative regulation that are, and continue to be, Class A hazard, shall not be required to be modified to meet the requirements of subsections (1) through (7) of this section unless the cabinet, based upon an inspection, determines that modification to meet some or all of these requirements is necessary to protect the public health or safety or to protect the environment.

(9) Emergency procedures. If any examination or inspection of an impoundment discloses that a potential hazard exists, the person who examined the impoundment shall immediately notify the department and the Kentucky Division of Water, or if these agencies cannot be reached, Disaster and Emergency Services. The mineral permittee shall immediately implement emergency procedures

formulated for public protection and remedial action. If adequate emergency procedures cannot be formulated or implemented by the mineral permittee, the cabinet shall be notified, and the cabinet shall notify the appropriate agencies that other emergency procedures are required to protect the public.

Section 2. Additional Requirements for Permanent Impoundments. (1) General.

(a) The retention of a permanent impoundment is subject to the approval of the cabinet.

(b) Permanent pit impoundments with no embankment are encouraged.

(c) It shall be demonstrated to the cabinet's satisfaction that adequate sources of water are available to maintain the water level of the impoundment at a reasonable elevation at all times. Adequate sources of water supply for impoundments may be from springs, drainage areas of sufficient size, groundwater percolation, a flowing stream, or any combination of these sources.

(d) In accordance with 405 KAR 5:030, if a permanent impoundment is proposed, an affidavit from the landowner approving the impoundment and acknowledging that the mineral permittee will have no continuing maintenance responsibility after permit release, is required, except for final pit impoundments with no embankment.

(e) Permanent impoundments shall be demonstrated to be a part of the approved postmining land use.

(2) If a permanent impoundment is proposed, the following stipulations shall be met:

(a) Adequate means of access, such as roads or ramps, are left or provided to the water impoundment.

(b) A terrace shall be provided above, but in near proximity to, the high water level of the permanent impoundment, except on the portion of the impoundment comprising the highwall of the pit.

(c) Any spoil above the terrace shall be graded until it is rounded off and blended into the area contour above the terrace.

(d) All spoil piles adjoining access roads to permanent impoundments shall be graded to minimize erosion and blend into the surrounding area.

(e) The angle of the slope from the roadbed to the top of the spoil may be greater than the surrounding area if adequate drainage measures are taken to prevent erosion of the slope, including but not limited to, terracing and vegetation.

(f) The roadbed shall be adequately drained and culverts shall be provided so as to prevent it from being eroded.

(g) The area above the highwall on any permanent water impoundment shall be protected by a landscape barrier or a fence approved by the Department for Natural Resources. (21 Ky.R. 758; 1132; 2110; eff. 2-22-1995; TAm eff. 8-9-2007; Crt eff. 7-3-2018.)